

IDENTIFICATION AND DISTRIBUTION OF *CENTAURIUM MUHLENBERGII*  
(GRISEB.) PIPER AND *C. PULCHELLUM* (SW.) DRUCE  
(GENTIANACEAE) IN LOUISIANA, MISSISSIPPI, AND TEXAS

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ABSTRACT

*Centaurium muhlenbergii* is reported as new to Louisiana, Mississippi, and Texas. The species is compared with and distinguished from the apparently closely related *C. pulchellum*. A key to the two species, a list of specimens examined, and a distribution map are also included. Three other *Centaurium* species mentioned as occurring in Louisiana are also discussed.

KEY WORDS: Gentianaceae, *Centaurium*, Louisiana, Mississippi, Texas

*Centaurium* is a taxonomically difficult genus of about 60 species of Old and New World distribution. Two species that occur in the United States, *Centaurium muhlenbergii* (Griseb.) Piper, a native, and *C. pulchellum* (Sw.) Druce, an exotic from Europe, bear close resemblance to each other. Both are annuals, lack rosettes or may have weakly developed ones, and possess small flowers with corolla lobes 2-5 mm long. The similarity of the two species, coupled with their previous mutually exclusive distributions in the United States (which hinders direct field comparison), have resulted in taxonomic uncertainty concerning the correct status of the plants. Prior to this study, *C. muhlenbergii* was known from central Washington south to central California, western Nevada, and Idaho (Cronquist *et al.* 1983). *Centaurium pulchellum* is widely distributed in eastern United States (Fernald 1950; Small 1933). Both Cronquist *et al.* (1983) and Hickman (1993) consider *C. floribundum* (Benth.) Robinson to be synonymous with *C. muhlenbergii* and further suggest that the latter name may well be reduced to synonymy under *C. pulchellum*. The present paper is intended to clarify the status of *C. muhlenbergii* and *C. pulchellum*, and document their distribution in the states treated. Additionally, reports of *C. calycosum* (Buckl.) Fern., *C. erythraea* Raf., and *C. texense* (Griseb.) Fern. in Louisiana will be evaluated.



Table 1. A summary of the major differences between *Centaurium pulchellum* and *C. muhlenbergii*.

	<i>C. pulchellum</i>	<i>C. muhlenbergii</i>
Height (cm)	(5)10-18(29)	(19)27-45(55)
Branching	midstem or below	upper 1/3-1/4 of stem
Inflorescence	open, spreading compound dichasium	dense, flat topped umbellate cyme
Flowers	*pedicelled	*sessile
Epicalyx	separated from calyx	at very base of calyx
Peak flowering time	15 April-24 May	8-24 June

\* See text for further explanation.

The study is based upon field observations and collections of both species and examination of herbarium specimens or photostatic copies of specimens from ASTC, BAYLU, BRIT, IBE, LAF, LSU, LSUS, LTU, NLJ, and TAES.

While *Centaurium muhlenbergii* and *C. pulchellum* have overall similarity, especially flower and leaf characteristics, there are substantial differences (Table 1) that evidence the distinctness of each. One item in the table requires further explanation. Whether a flower is sessile or pedicelled is determined by the location of the epicalyx, the two bracts subtending the calyx. In pedicelled flowers, the epicalyx is slightly separated from the calyx, while in sessile flowers the calyx is immediately subtended by the epicalyx. This trait is more apparent on the lateral flowers of the ultimate cymes.

Although the plants may be distinguished by use of the table, the following key, adapted in part from Hickman (1993), provides for accurate and easy distinction between the two plants.

1. Flowers essentially sessile; inflorescence umbellate-cymose, dense, flat topped; plant normally branching in the upper one-third to one-fourth. . . . . *C. muhlenbergii*
1. Flowers pedicelled; inflorescence an open compound dichasium, not flat topped; plant normally branching in the lower one-half. . . . . *C. pulchellum*

This is the first report of *Centaurium muhlenbergii* (which includes the synonymous *C. floribundum*) in Louisiana, Mississippi, and Texas. The size of the

plant (up to 55 cm), dense clusters of bright pink flowers, colonial nature, and mainly roadside occurrence make the species very easy to locate, thus suggesting it to be a rather recent arrival. This is supported by the earliest known Texas specimen [*Amerson 510* (BRIT)] being collected in 1971 and the earliest located Louisiana specimen [*Thieret 26682* (LAF)] being collected in 1968, but both being misidentified as either *C. pulchellum* or *C. texense*. The only Mississippi record was collected in 1989. Figure 1 shows the documented distribution of the species in the three states.

Specimens examined: Louisiana. Avoyelles Parish: Pinewoods along Big Creek at North Point, ca. 5 miles N of Effie on Hwy 115, 2 Jun 1979, *Allen 8747 & Vincent 2011* (NLU); Bienville Parish: Median of I-20 at rest area W of Hwy 154 and E of Ada exit W of Arcadia, Sec. 8, T18N, R7W, 11 Jun 1987, *Thomas 100093, Dorris, & Day* (NLU); Bossier Parish: East bank of the Red River, 1.2 miles SE of the Barksdale Highway bridge on Hwy 71, Sec. 10, T17N, R13W, 14 Jun 1976, *Leggett & Leggett 1771* (NLU); Caddo Parish: Texas & Pacific Railroad in S Shreveport at intersection of Hollywood & Jewella, Sec. 22, T17N, R14W, 29 May 1982, *Lewis 3515* (NLU); K.C.S. Railroad and Hwy 173 at overpass S of Blanchard, NW part of Sec. 29, T18N, R14W, 10 Jun 1975, *Thomas 45375 & Thomas* (BAYLU [photo], LSU,NLU); Northern edge of Kansas City Southern Railroad Yard W of Hwy 173 at North Lakeshore Drive S of Blanchard, Sec. 19, T18N, R14W, 28 Jun 1979, *Thomas 66460* (BAYLU [photo],LSU,NLU); Prairie area along Wallace Lake Road S of Overton Road S of Shreveport and N of Wallace Lake, Sec. 30, T16N, R13W, 15 Jun 1990, *Thomas 119136 & Raymond* (NLU); I-220 E of Hwy 71 and Hwy 1 N exit in Shreveport, Sec. 15, T18N, R14W, 8 Jul 1994, *Thomas 140263* (BAYLU); Rapides Parish: Roadbank of Hwy 165 and Hwy 3026, just S of Kingsville, Sec. 36, T5N, R1W, 18 Jun 1978, *Pias & Breard 3577* (NLU); "Ruins" of Camp Beauregard, 3 miles SE of Simms, ca. 9 miles NE of Pineville, Sec. 33, 12 Jun 1967, *Thieret 26682* (LAF); Red River Parish: High bluffs of Red River, across from Coushatta, 1.8 miles S of U.S. Hwy 84, 17 Jun 1983, *Gilmore 1833* (LTU). Mississippi. Smith Co.: Tallahala Wildlife Mgmt. Area ca. 1 mi. N of Clear Springs, NW1/4 of NE1/4 Sec. 26, T4N, R9E, 22 Jun 1989, *Carraway 895* (IBE). Texas. Ellis Co.: 5.9 miles N of Avalon on Farm Market Road 55 near Little Onion Creek, 22 Jun 1994, *Holmes 7268 & Wivagg* (BAYLU); Falls Co.: 0.5 mile W of Big Creek on Tx. Hwy 7, ca. 6.5 miles E of Marlin, 17 Jun 1994, *Holmes 7237 & Wivagg* (BAYLU); Freestone Co.: Tx. Hwy 164, 3.3 miles E of the Limestone Co. line, 9 Jun 1994, *Holmes 7165 & Wivagg* (BAYLU); N side Tx. Hwy 164 at Fulton Hill, 4.2 miles E of Donie, 16 May 1995, *Holmes 7683* (BAYLU); Hardin Co.: Between Batson and Saratoga near West Hardin Schoolhouse, 7 Jun 1971, *Amerson 510* (BRIT); Hill Co.: 0.3 mile W of Mt. Calm on Tx. Hwy 31, 22 Jun 1994, *Holmes 7259 & Wivagg* (BAYLU); Johnson Co.: Farm Road 916, 1.5 miles W of the Ellis Co. line, ca. 4.2 miles east of Grandview, 22 Jun 1994, *Holmes 7274 & Wivagg* (BAYLU); Leon Co.: Roadside, Tx. Hwy 7, just E of the Robertson Co. line, ca. 2 miles W of Marquez, 17 Jun 1994, *Holmes 7243 & Wivagg* (BAYLU); Limestone Co.: Tx. Hwy 164, 4.5 miles W of Personville, ca. 100 m east of Turkey Creek, 3 Jun 1994, *Holmes 7138* (BAYLU); Jct. Limestone Co. Roads 905 & 894, just east of Lake Limestone, 17 Jun 1994, *Holmes 7257 & Wivagg* (BAYLU); McLennan Co.: F.M. 3400, ca. 1/2 miles SE of Loop 340, ca. 3 miles SE of Waco, 20 Jun 1991, *Holmes 5278* (BAYLU); Milam Co.: Tx. Hwy 36, just S of the Little River bridge, S of Cameron, 26 Jun 1994, *Holmes 7295 & Wivagg* (BAYLU); Navarro Co.: ca. 3 miles NE of Hubbard on Tx. Hwy 31, just E of the Hill Co. line, 22 Jun 1994, *Holmes 7263 & Wivagg* (BAYLU); Robertson Co.: Tx. Hwy 7, ca. 9.5 miles E of Kosse on Tx. Hwy 7, ca.

80 m east of the Limestone Co. line, 17 Jun 1994, *Holmes 7241 & Wivagg* (BAYLU).

*Centaurium pulchellum* has long been known to occur in Louisiana and Mississippi (Small 1933). Unfortunately, we have not had access to any specimens from Mississippi, thus further comment is not possible. The species was first reported in Texas by Correll & Johnston (1972). Turner (1993), in a treatment of the genus for Texas, provided documentation of the species in Hardin and Brazoria counties. Figure 1 depicts the distribution of the species in Louisiana and Texas. The plant is often misidentified as *C. texense*.

Specimens examined: Louisiana. Allen Parish: Paved road W of U.S. 165 at a pumping station three miles N of Kinder, Sec. 13, T6S, R5W, 3 Apr 1982, *Thomas 80607 & Allen* (NLU); Sun Oil Co. Road, W of U.S. 165, 1.2 miles N of Kinder, Sec. 24, T6S, R5W, 25 May 1983, *Thomas 83728* (NLU); Allen Parish Road 122, ca. 1/2 mile W of U.S. 165, ca. 2 miles N of Kinder, 20 Apr 1981, *Allen 10663* (NLU); Prairie strip S of Railroad and U.S. 90, ca. 1 mile E of Midland, 6 May 1989, *Allen 16423* (NLU); U.S. 190 just W of the Calcasieu River W of Kinder, Sec. 30, T6S, R5W, 25 May 1983, *Thomas 83735* (NLU); Beauregard Parish: Roadside along U.S. Hwy 171, Beauregard-Calcasieu Parish line, 3 May 1975, *Adams 1841* (LTU); Calcasieu Parish: Cleared area W of DeQuincy Middle School beside La. 12 in W part of DeQuincy, 5 Jun 1992, *Thomas 129558* (NLU); Railroad tracks and La. 12 at the Railroad Museum in DeQuincy, Sec. 18, T7S, R10W, 5 Jun 1992, *Thomas 129551* (NLU); La. 27 S at I-10E exit on south side of Sulphur, Sec. 3, T10S, R10W, 22 Jun 1982, *Thomas 81554 & Kessler* (NLU); Roadside along U.S. Hwy 171, Calcasieu-Beauregard Parish line, 3 May 1975, *Adams 1840* (LTU); Ca. 2.5 miles S of Gillis, 4 May 1968, *Thieret 28829* (LAF); Cameron Parish: Roadbank at bridge on Sweet Lake camp road about 0.2 mile S of Cameron Parish, Road 445, Secs. 24 & 25, T12S, R8W, 12 May 1984, *Thomas 88555 & Dutton 1788* (NLU); Jct. of La. 717 and Hwy 14 SE of Lake Arthur, Secs. 2 & 11, T12S, R3W, 19 Apr 1984, *Thomas 88020 et al.* (NLU); Jct. of Cameron Parish Road 445 and Precht Road, 1.0 mile W of La. 384 & NW of Sweet Lake, Sec. 24, T12S, R8W, 12 May 1984, *Thomas 88558 & Dutton 1791* (NLU); Roadbank along a 0.3 miles section of Cameron Parish Road 421, just E of La. 384 and S of the Calcasieu Parish line, NW of Grand Lake, Sec. 4, T12S, R9W, 13 Apr 1984, *Dutton 1223 & Taylor 6700* (NLU); La. 14 at Vermilion Parish line E of Lake Arthur, Sec. 2, T12S, R3W, 19 Apr 1984, *Thomas 87958* (NLU); Evangeline Parish: La. 104, 0.3 mile E of Bayou Nezpique Bridge at Allen Parish, 23 May 1978, *Cormier 726* (NLU); Jefferson Davis Parish: La. 97 just S of I-10, ca. 1 mile NE of Jennings, 5 Jun 1980, *Vincent 3646* (LSU); Lasalle Parish: Median of U.S. 165 at U.S. 84 in Tullos, Sec. 25, T10N, R1E, 17 May 1980, *Thomas 71298 & Thomas* (NLU); Tullos, just NW of La. Hwy 125 and about 1.2 miles SW of U.S. Hwy 84, 22 Apr 1988, *Boyd 3000* (LTU); St. Tammany Parish: I.H. 12 & La. 434 W of Hammond, 3 May 1989, *Urbatsch 5451 & Cox* (LSU); Tangipahoa Parish: La. 22 at crossroads just W of Bedico Creek W of Bedico and E of Ponchatoula, Sec. 45, T7S, R9E, 17 May 1983, *Thomas 83480 et al.* (NLU); Vermilion Parish: Orange Road off La. 82 S along Vermilion River, 7 miles S of Abbeville, Secs. 6 & 7, T12S, R3E, 30 May 1987 *Slaughter 509* (NLU); La. 14 at Cameron Parish line E of Lake Arthur, Sec. 35, T11S, R3W, 19 Apr 1984, *Thomas 87972 et al.* (NLU). Texas. Brazoria Co.: Tx. Hwy 2004 at New Bayou S of Alvin, 5 Apr 1986, *Brown 9888* (NLU); Galveston Co.: Roadside, Texas Hwy along beach five miles W of Galveston, 31 Mar 1972, *Lowery 675* (LTU); Hardin

Co.: Hwy 96, Lumberton, 6 May 1995, *Singhurst 3067* (BAYLU); 2.2 miles E of Saratoga along and S of Hwy 770, 30 Jun 1984, *McLeod s.n.* (ASTC); Harris Co.: Intersection of Pasadena Blvd. & Underwood Street, Deer Park, 18 May 1985, *Brown 8770* (ASTC); Eisenhower Park S of the Dam at Lake Houston, 12 May 1984, *Brown 7296* (NLU); Jasper Co.: 3.1 miles S of Farm Market road 105 from its Jct. with Farm Market 1131, 22 May 1988, *Jones & Jones 1664* (TAES); 3.4 miles E of Buna along Farm Market Road 263, 14 May 1985, *ig. leg.* (ASTC); Liberty Co.: U.S. Hwy 90 between Dayton & bridge over Cedar Bayou, 23 May 1987, *Brown 11140* (NLU); Limestone Co.: Tx. Hwy 174, ca. 13 miles E of Groesbeck, near road to Lake Limestone, 16 May 1995, *Holmes 7684* (BAYLU); Orange Co.: 1-10 right-of-way at Adams Bayou east of Orange, 14 May 1974, *Thomas 38978 et al.* (NLU); Rusk Co.: Ca. 3.5 miles N of the junct. of Tx. Hwy 322 & Tx. Hwy 259 on Hwy 259, 20 April 1988, *Nixon 16617* (ASTC, BAYLU [photo]); Tyler Co.: U.S. Hwy 190 at Steinhagen Lake, just W of the Jasper Co. line, 14 Apr 1995, *Le Noir s.n.* (BAYLU).

Further comment on *Centaurium* in Texas is not needed since Turner (1993) provided an accurate account of the species in the state and, as mentioned, is not possible for Mississippi because of the lack of specimens. Several other species of *Centaurium*, however, have been reported in Louisiana. With clarification of the status of *C. pulchellum* and *C. muhlenbergii*, it is now possible to comment on these reports.

*Centaurium calycosum* (Buckl.) Fern. was reported by MacRoberts (1987) as occurring in DeSoto Parish, based upon *Gilmore 1833* (LTU). Turner (1993) gives the distribution of *C. calycosum* as being primarily in the western portions of the Edwards Plateau of Texas, and several adjacent areas, such as México. It is reported by Cronquist *et al.* (1983) as occurring in New Mexico, Arizona, Utah, *etc.* Upon examination, *Gilmore 1833* proved to be *C. muhlenbergii* collected near Coushatta in Red River Parish.

MacRoberts (1987) also reported *Centaurium erythraea* Raf. from Caddo Parish, citing *MacRoberts 550, 923, 1201, & 2688* (all LSUS). This species is an European native that has become naturalized from northern coastal California to Washington (Hickman 1993). The plant is similar to *C. muhlenbergii* in appearance but is a biennial with a conspicuous basal rosette and has corolla lobes 5-7 mm long. Examination of clear photocopies of these specimens showed they lacked basal rosettes and appeared to be annuals. They are thus referable to *C. muhlenbergii*.

*Centaurium texense* (Griseb.) Fern. was reported from Rapides and Calcasieu parishes by Thieret (1968). The distribution of this species includes the eastern edge of the Balcones Escarpment of Texas, eastern Oklahoma, northwestern Arkansas, and southwestern Missouri. The plant is limited to dry, limestone derived soils and eroded limestone slopes, glades, and roadcuts, all non-existent in Louisiana. The specimens cited by Thieret (1968), *Thieret 26682* and *28829* (both LAF) proved to be *C. muhlenbergii* and *C. pulchellum* respectively.



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